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Description of DE10063018

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The invention relates to a reciprocally adhesive adhesive foil, which are again solvable by drawing pulling toward the gluing level, as well as its use.

Adhesive films for again-solvable gluing, which are again solvable by pulling toward the gluing level, are already and in the commerce under the designation adhesive tape power Strips? and/or, ?COMMAND adhesive? 3M available. Thus, manufactured gluing offer strong stop and can nevertheless without trace again be solved without damage of the underground or the joining parts, as this is described in DE 33 31 016 C2. Also in DE 42 33 872 C2 are described such adhesive foils as well as an hook, whereby the hook is quite re-usable.

WHERE 92/11333 and WHERE again-solvable tapes with an intermediate member from a stretchable, but not resetting film describe 93/01979. Such films can be removed by train toward the gluing level again, but a reusability is given in no case, since these products do not strip? after again into their original condition back resolvable can. WHERE 92/11332 describe again-solvable tapes, which use also stretchable, resetting films as intermediate members, however excluding photo-polymerized acrylate bonding emulsions are used, which have disadvantages, which affect themselves in the practice quite disturbing to such products. A reproducible crosslinking of the detention adhesive is difficult to reach, what entails appropriate fluctuations of the product properties. Besides an inevitable remainder content of photo initiator, that leads in particular with later under sunlight effect, approximately at window glasses, to clear changes of the adhesive layer, remains to Nachvernetzung, yellowness and Verfärbung, so that a airways-free Abstreifen is not any longer reached. Also an unavoidable remainder monomer content (at least 1%) is health-precariously, in particular with inside applications. Likewise decay products of the photo initiator, in particular, can lead benzoic acid methyl esters to migration and change of the product properties. The reaction heat, which becomes free during a laminar UV polymerisation of acrylates, can damage or stay the carrier. A Compoundieren with z. B. is only very reduced possible for resins, since these disturb the UV polymerisation. And unfavorably is also the inevitably received cross-linking profile of the adhesive: usually the UV polymerisation becomes conducted by mass-lateral UV irradiation. Thus one receives adhesive layers with a higher crosslinking at the adhesive surface than to the carrier. Consequence is a reduced Tack and a bad mass anchorage. If by the carrier one UVilluminates, which improves both a better Tack, adhesion and mass anchorage effectuation, the carrier must be permeable UV. Many carriers and many SB5/SIS of block copolymers are well UVpermeable however not particularly or by UV light are damaged.

Altogether are the product properties with the fact like that that longer sticking together is not ensured in continuous quality, and in particular no airways-free Abstreifen, as this in WHERE 92/11322 on S. 19, table 2, nips 6 also one occupies, as mass errors at the edges of gluing remain there (footnote A), if the products tear not anyway (footnote b).

Further US describes 4,024,312 high-drawable adhesive foils, which a beam from high elastic, thermoplastic processable styrene block copolymers of the type A-B-A (with A Poly (styrene), B = Poly (isopren), Poly (butadiene) or their hydrogenation products) possesses. The carrier can optionally with the block-polystyrene domains miscible resins, preferably in a quantity from 85 to 200 parts per 100 part elastomer, admitted be. The carrier is at least on one side ^a treated with a detention adhesive. The flexible deformation of the tapes amounts to at least 200% that modulus with 50% elongation is < 13.8 MPa (2000 lbf/inch²). The flexible block deformation after drawing around 50% amounts to at least 75%. The detention adhesives use either polyisoprene (z. B. Natural rubber) or also the synthesis indie rubbers on styrene block polymer basis in merging with sticking resins, used for the carrier material, and if necessary further merging components. Tapes can be removed easy by drawing parallel to the gluing surface from the clamping coat. Such adhesive splicing tapes do not have constant product properties due to the migrating ability of the low-molecular components (resins, plasticizing agents) between detention adhesives and carriers. Mechanical solidities of the carrier and properties of the used detention adhesives are irreversibly changed by the diffusion of the resins. A purposeful adjustment and control of the product properties, as essential for technical gluing, are not possible thereby.

Also such adhesive film laminates from a flexible support, both sides coated with acrylate bonding emulsion are from: EP 761,793 a2 well-known, without however these products in the practice can convince, in particular because of their insufficient anchoring between carriers and sticking mass.

To further such adhesive foils is referred to WHERE 92/11332, DE 42 22 849, WHERE 95/06691, DE 195 31 696, DE 156 26 870, DE 196 49 727, DE 196 49 728, DE 196 49 729, DE 197 08 366, DE 197 20 145, further on DE 195 11 288, US 5,507,484, US 5,672,462, WHERE 94/21157, finally to specific embodiments also on DE 44 28 587, DE 44 31 914, WHERE 97/01712, DE 156 27 400, WHERE 48/03691 and DE 196 49 636, DE 197 20 526, DE 197 23 177, DE 197 29 3198, DE 197 26 375, DE 197 56 064, DE 197 56 816, WHERE 99/31193, WHERE 99/37729 and WHERE 99/63018.

Object of the invention was it to create here remedy to create in particular a such adhesive foil laminate with the adhesive sufficiently well on the means embodied and with that at the same time the application under erdrieten requirements concerning moisture and/or clamping coat took place, especially a gluing on Vinyltapeten and such a thing should have been possible, as well as a gluing with elevated air humidity.

This, as in the claims more near described, is solved on which expressly respect is taken, in order to avoid repetitions. Preferential elastomers for the carrier are:

1. Styrene block copolymers

Styrene Isopren and styrene butadiene block copolymers are suitable as well as their hydrogenation products Styrene ethyl/Butylen and styrene ethylene/propylene block of copolymers. Block copolymers according to invention know linear SEB (S designates the polystyrene block, E the elastomeric block) three-block polymers in addition, radial and star shaped (SE) \times of block copolymers (\times designates the n-functional coupling component); mol n \times / n = 3 and linear (SE) n-block polymers etc.

Typical block polystyrene contents lie within the range of approx. 8 to 50% Gew.%, prefers between approx. 15 and 45 Gew.-%. The SE two-block content is preferentially too < to select 50%.

1. Natural rubber
2. Polyisoprene
3. Polybutadiene
4. Polychloropren rubber
5. Butyl rubber
6. Silicone rubber
7. EPDM rubber or Etylen propylenecopolymers
8. PU (z. B. Walapur 2201/Wolff Walrode, Plafilon UO1/Atochem, Desmopan/Bayer, Elastolan/Elastogran)
9. Vinyl copolymers

1. Etylen vinyl acetatecopolymers (z. B. Company M & W: 524,060, companies Exxon, Exxoncel film)
2. Vinyl chloride acrylate copolymers

10. Polyetherester (z. B. Arnika/Akzo, Hytrel/DuPont)
11. Polyether and - ester amides (z. B. Pebax/Atochem, Grilon/Emg chemistry)
12. Polycarbonate polyester copolymers

Suitable sticking resins are in particular hydrogenated sticking resins. Are preferentially suitable and: A. hydrogenated polymers of the decyloleptadiene (z. B. Escorez S300er series; Exxon chemicals), hydrogenated polymers of prefers C-8 and C-9 aromatics (z. B. Regalite and Regalrez series, Hercules Inc. // Arkon P series, Arakawa), these can be made of pure aromatic stream by hydrogenation by polymers or be based also by hydrogenation polymers of C-8 and C-9 aromatics (z. part-hydrogenated by polymers on basis of mixtures of different aromatics. B. Regalite and Regalrez series; Hercules Inc. // Arkon M; Arakawa), hydrogenated Polyisoprenharze (z. B. Clearon M; Yasuhara), hydrogenated C-5/C9-Polymerisate (z. B. ECP-373; Exxon chemicals), aromatic-modified selectively hydrogenated Dicyclopentendenderivate (z. B. Escorez S500er series, Exxon chemicals) as well as hydrogenated and part-hydrogenated rosin-based resins (z. B. Foral, Foralyn, Hercules // hydraulic count; DRT). Aforementioned sticking resins can be used both alone and in the mixture. The major portion of the sticking resins forms typically hydrogenated hydrocarbon and/or hydrogenated Polyterphenharze. Sticking resins on basis of hydrogenated rosin and its derivatives (z. B. Esters of the hydrogenated rosin) are usually selected against it as merging components.

1. Ethyl acrylate copolymers
2. Abs copolymers

Further the aforementioned elastomers can be used also as component in Polymerblends. For adjustment the mechanical properties can a crosslinking of aforementioned materials be favourable.

Suitable acrylate bonding emulsions inclusive. Merging components (sticking resins, fillers, pigments) are:

- and - free Arylthioalkoholen containing solvent; Copolymers on basis
- Acrylic acid /Methacrylic Säure and their ester with C1 to C25-Atomen, mark in, Fumar, Itaconsäure and their ester, substituted (Meth) acrylamides; further compounds, like z. B. Vinyl ester, vinyl alcohol and/or their ester.
- Compound from acrylate copolymers and resins, like z. B. Foral 85 E
- Compound from different acrylate copolymers
- Compound from acrylate copolymers and further polymere merging components.
- Optional are additives in the form of inorganic and organic materials, like z. B. Glass spheres, - flay, pigments, antibagging agents, to carbon black, to use titanium dioxide according to invention.

The used acrylate copolymers become the production of a sufficient coherence usually crosslinked. For the reaching of a cross-linking density even over the layer strength thermal initiated cross-linking procedures are, z. B. the crosslinking over Metalinitate suitable. A very homogeneous cross-linking profile can be reached also by means of its irradiation. Steuergrosser for the Vernetzungsdichteprofil is the accelerator tension of the source of electron beam. In dependence of the weight per unit area of the adhesive film which can be through-radiated thereby a one-sided irradiation can (preferably with low weight per unit areas, in addition, with high weight per unit areas, if a sufficiently high accelerator tension is available) or for adjustment a reciprocating radiation (preferably during high weight per unit areas and low accelerator tension) a homogeneous cross-linking density to be selected.

Dispersion acrylates have due to their high mol mass usually a coherence sufficient for the applications described here, so that generally no additional crosslinking is more necessary.

For the improvement of the anchoring of the detestation adhesives on the intermediate member can be submitted of a latter physikalischen and/or chemical pretreatment (priming). Suitable pre-operative methods are z. B. the Corona, the flaring, the plasma pretreatment as well as the fluorine treatment.

Particularly suitable as acrylate bonding emulsions are such Schnellhaftkleber/Hotmelt, in particular in accordance with DE 39 47 232 A1, on whose examples 1-3 expressly respect is taken.

In the following the invention is to be described on the basis embodiments, without wanting unnecessary to limit these however thereby.

Example 1

After the patent DE 39 47 232 A1, example 1, manufactured acrylate Hotmeltmasse becomes with the help of an a screw-type extruding machine (company VICTORY, Dr. Green-seize, extrusion data: 30-250 DEG C, pressure: 30-150 bar) with one of revolution 50/min. by an adjusted broad slot nozzle (company Breyer) on mikonisieretes release paper extrudes (120-140 DEG C). Layer thickness 150 mu m.

On the following Chillrol (90 DEG C), after the feed of the support (on antilhesive paper over the auxiliary completion by means of pressure roller 90 DEG C, 5-19 kN), the lamination of the AC-Hotmelt (150 g/gm) and TK takes place (Web speed: 10-100 m/min).

The carrier consists of:
28.50% Kraton GRP 6919 (company Shell),
20.00% Kraton G 1657 (company Shell),
20.00% ESCOREZ 5615,
20.00% ESCOREZ 5699 (companies Exxon),
0.50% IPGANOX 3052,
0.50% Tinuvin 571,
0.50% Weston 399 (companies Egiba),
with a thickness of 0.6 mm.

Afterwards one tapes, and on the back (carrier) now again 150 g/gm the AC-Hotmeltmasse is extruded.

Finally takes place a reciprocal ESH crosslinking with: 230 KV and 60 KGr.

By relatives punching one receives then products from the type and measure of the well-known poster Strips

Example 2

The acrylate Hotmeltmasse on antilhesive paper, manufactured in example 1, is separately together-covered with ESH crosslinked and afterwards with the means in accordance with example 1 by heatable (90-110 DEG C) pressure rollers.

The punched 2 cm broad poster Strips then defined pressure (10 kg/qcm) on the test specimen, tapeziert with SANGETSU SG-294 (AA) - wallpaper, bonded.

The peeling load (per 2 cm) amounts to 8 g with 35 DEG C and 85% rel. Moisture. With this testing no separation showed up (after 24 hr.). Thus the product is well suitable also for these difficult conditions.

Under these test criteria the commercial poster Strips separates within 24 hr. and are not thus suitable for these requirements.



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1. Reciprocally stick adhesive foil from a laminate, for gluing, which are arrears-free and damageless again separable by drawing pulling on the laminate toward the gluing level, coated with means on basis by elastomers, reciprocally with an acrylate bonding emulsion, characterised in that of the carriers beside elastomers 30 to 70 Gew.%, sticking resin contains.
2. Adhesive foil according to claim 1, characterised in that of the means from 30 to 70 Gew.%, elastomer on basis of styrene block copolymers exists.
3. Adhesive foil according to claim 1, characterised in that the content of sticking resin in the substrate 37 to 63 Gew.%, amounts to.
4. Adhesive foil according to claim 1, characterised in that of the acrylate bonding emulsions a acrylate hotmelt is, in particular a crosslinked acrylate hotmelt is.
5. Adhesive foil according to claims 1, where the acrylate bonding emulsion is such on basis of an acrylate copolymer, that if necessary, in form of a compound with resins, different acrylate copolymers, further polymere merging components and/or additives is present.
6. Adhesive foil according to claim 5, where the aryl R¹ copolymer is such from acrylic acid esters and acrylic acid, in particular from 2-ethylhexylacrylat, butyl acrylate, n third, - Butylacrylamid, isooctylacrylat, glycidylmethacrylat and acrylic acid.
7. Adhesive foil according to claim 1, where the carrier has a thickness of 50-100 mu m and the bonding emulsion on one or both sides one thickness each of 25-800 mu m, whereby the adhesive foil laminate has altogether a thickness of 75-2600 mu m.
8. Adhesive foil according to claim 1, where the adhesive foil laminate pigments dyed, filled or in particular water clear/transparent is.
9. Adhesive foil according to claim 1, characterised in that their relationship from tearing strength to Stripkraft more as 1.5, in particular more than 2.5 is.
10. Adhesive foil according to claim 1, characterised in that it an non-adhesive Anfasser exhibits.
11. Use of an adhesive foil after one of the claims 1-10 for sticking together with elevated air humidity, in particular for sticking together on Vinytapefen.